Draw
the Process

System Design	System Requirements Analysis	Software Architecture Definition	SW Req. Analyses and Use-Case & Scenario Def.	CSCI Prel. Design	Rqts. & Prelim. Design for *Release "X"*	Detailed Design *Release "X"*	Code & Unit Test *Release "X"*	CSCI Integration Verification, Qualification Test *Release "X"*	SS Integration & Test	PIAT&C Integration & Test	PA&T Integration & Test
Baseline (BL)	**System Requirements**	**Initial SW Architecture**	**SW Requirements**	**Preliminary Design/Build Plan**		**CSCI Implementation**			**SS I&T**	**PIAT&C**	**PA&T**
						Detailed Design	***Code & Unit Test***	***CSCI Integration & Test***			
Ref. Docs.	IDE Folder 34158	IDE Folder 17486	IDE Folder 6458 & 8056	IDE Folder 12056 & 14053		IDE Folder 18959	IDE Folder 18959	IDE Folder 18959	IDE Folder 23247		
Change Auth:	Lead Sys Requirements Mgr. Mgr. Sys. Eng.	SW Architect	Lead Sys. SW Requirements Mgr. Sys. Eng. Software Release Manager	Software Release Manager Rose Model: SW Architect SSI BP: Seg SW TL & PIAT&C TL		Software Release Mgr.	Software Release Manager	I&T Manager	I&T Manager	PIAT&C TL	PAT&C TL
CI Element(s) Name & Content:	**Sys. Requirements** 1. Rose Sys Level Req.* • Use Case Model • Activity diagram • Test Files 2. Rose Sys Level Analysis Model • Anal. Class Hierarchy • Interaction diagram 3. Peer Review Info. • Use Case Review • Analysis Model Rev. 4. Specified Classes - RTM • Sys Level Use Case** • Seg. Scenario (SSC)** • Seg. Beh. (SBE)** 5. Walkthrough Info. • Sys. Architecture (Exit Criteria is Closure of the Sys. Arch. WT)	**Initial SW Arch.** 1. Rose Objective Architecture Model 2. CSAD	**SW Requirements** 1. Specified Classes - RTM • Build (BLD) • Scenario (SCE) • SW Requir. (SWREQ) • Use Case (USE) • CSCI (CSC) • Interfaces (CIF) • Messages (CIM) • Data Elements (CID) • Bld Imp. Scope (BIS)*** 2. Sequencing Logic 3. BRD or SW Reqts Spec. 4. Peer Review Info. • Use Case Review • Use Case Scen. Review • Draft SRS TIM • Prelim. SRS TIM 5. Walkthrough Info. • Final SRS (Exit Criteria is Closure of the Final SRS Walkthrough)	**Build Plans** 1. SSI Build Plan 2. CSCI Build Plan 3. Walkthrough Info. • CSCI-Release BP Recon. • Seg SW-Rel. BP Recon. **CSCI Preliminary Design** 1. Algorithm Description Documents 2. Ada Specifications 3. ATOT 4. Concept of Execution 5. Walkthrough Information • Seg. Scen. Children • CSCI Scen. Diagram • Prelim. Design Desc. • Det. Des. Readiness (Exit Criteria is Closure of the Detailed Design Readiness WT)		**CSCI Software** 1. Ada Package Bodies 2. Ada Specifications 3. C++ Headers 4. C++ Code 5. Walkthrough Info. • Det. Des. Artifact (Exit Criteria is Closure of the Detailed Design Artifact Walkthrough)	**CSCI Software** 1. Source Code (Units) 2. Unit Test Plan 3. Unit Test Results 4. BOM (Unit Test) 5. Unit Code & Test Peer Rev. 6. Walkthrough Info. • Unit Test Results (Exit Criteria is Closure of the Unit Test Results WT) **Unit Test Artifacts (Harness)** Examples; • Units Under Test • Test Drivers • Configuration Files • Coverage Analysis • Test Lists • Test Cases • Summary Reports	**CSCI Software** 1. CSCI I&T Plan or SITP 2. CSCI I&T Descrip. or SITD 3. BOM(CSCI Integration) 4. Software Test Report 5. Anomaly List 6. Release Notes 7. Walkthrough Info. (Final) • Unit to CSCI Integ./Test • CSCI/Segment Reconcil. • CSCI Test Results (Exit Criteria is Closure of the CSCI Test Results Walkthrough) **CSCI Test Artifacts (Harness)** Examples; • RTC Software • RTC Scripts • BIN Configuration	**Segment Software** 1. CSCI Software 2. Segment SW I&T Plan 3. Source Code (Segment) 4. BOM (Segment) 5. Seg. SW Test Desc. 6. Seg. SW Test Report 7. Release Notes 8. Test Artifacts Data 9. Test Harness 10. Change Sets 11. Walkthrough Info. • Seg. SW & Seg/Sys SW/HW ITP Recon. • Seg. SW Test Results (Exit Criteria is Closure of The Segment Software Test Results Walkthrough)	**System Configuration** 1. Segment Configuration 2. Segment Software 3. Seg/Sys SW/HW I&T Plan 4. Seg/Sys SW Test Desc. 5. System Test Report 6. Release Notes 7. Test Artifacts Data 8. Test Harness 9. Walkthrough Info. • Seg/Sys SW/HW Test Results (Exit Criteria is Closure of the Seg/Sys SW/HW Test Results Walkthrough)	**System Release** 1. Sys. Config. 2. Seg. Config. 3. STP 4. STD 5. STR 6. Release Notes 7. Test Harness
Work Products & Mech./Location	**Apex** +Rose Model Files	**Apex** +Rose Model Files		**Apex** +Ada Specifications +Rose Model "Snapshot" +ATOT		**Apex** - Ada Package Bodies - Ada Specifications - C++ Code - C++ Headers	**Apex** - Unit Test Artifacts (Harness) - Source Code - BOM (Unit Test)	**Apex** - Source Code - CSCI Test Artifacts (Harness) - BOM (CSCI Integration) - RTC Software - Anomaly List - RTC Scripts	**Apex** - Test Harness - Source Code (Segment) - BOM (Segment Final)	**Apex** - Test Harness	**Apex** - Test Harness
	IDE +Action Items +Peer Review Info. +Walkthrough Info. **RTM** - Specified Classes	**IDE** +CSAD	**IDE** - Bld Req. Document - SW Reqts Specification - Sequencing Logic +Peer Review Info. +Walkthrough Info. - CSAD **RTM** - Specified Classes	**IDE** - Algorithm Description Doc. +Concept of Execution - SSI Build Plan - CSCI Build Plan - Crew Interface Spec (CUI Only) +Walkthrough Information		**IDE** +Det. Design Artifacts +Walkthrough Info.	**IDE** - Unit Test Plan - Unit Test Results + Peer Review Information +Walkthrough Information **Rational TestMate** +Ada Unit Test **SEGUE** +Non-Ada Tests **INSURE ++** +Non-Ada Tests	**IDE** - CSCI I&T Plan or SITP - CSCI I&T Description or SITD - Software Test Report - BOM (CSCI Integration) +Release Notes - BIN Configuration +Walkthrough Information **RTM** - Software Test Case - Software Test Results +Software Test Class - Build Imp. Scope (BIS)***	**IDE** - Seg. Configuration - Seg. SW I&T Plan - Seg. SW Test Desc. - Segment SW Test Report - BOM (Segment Final) +Walkthrough Info.	**IDE** - System Configuration - Seg/Sys SW/HW I&T Plan - Seg/Sys SW Verif. Test Desc. - System Test Report +Walkthrough Info.	**IDE** - Sys. Config. - STP - STD - STR

BL = Baseline, **CI** = Configuration Item, **CSAD** = Crusader Software Architecture Document, **I&T** = Integration & Test, **CSCI** = Computer Software Configuration Item, **TL** = Team Lead, **WT** = Walkthrough, **RTM** = Requirements and Traceability Management, **ATOT** = Architecture Trade and Optimization Tool, **PR** = Peer Review, **SS** = Segment Software, **BOM** = Bill of Material, **SW** = Software, **PIAT&C** = Product Integration Assembly Test & Checkout, **PA&T** = Product Assurance & Test, **STD** = System Test Description, **STR** = System Test Report, **STP** = System Test Plan

NOTE: "SW Subsystem" may replace "CSCI" when Appropriate

+Indicates "Version/Revision Control" (Performed by SW Developers & Testers)

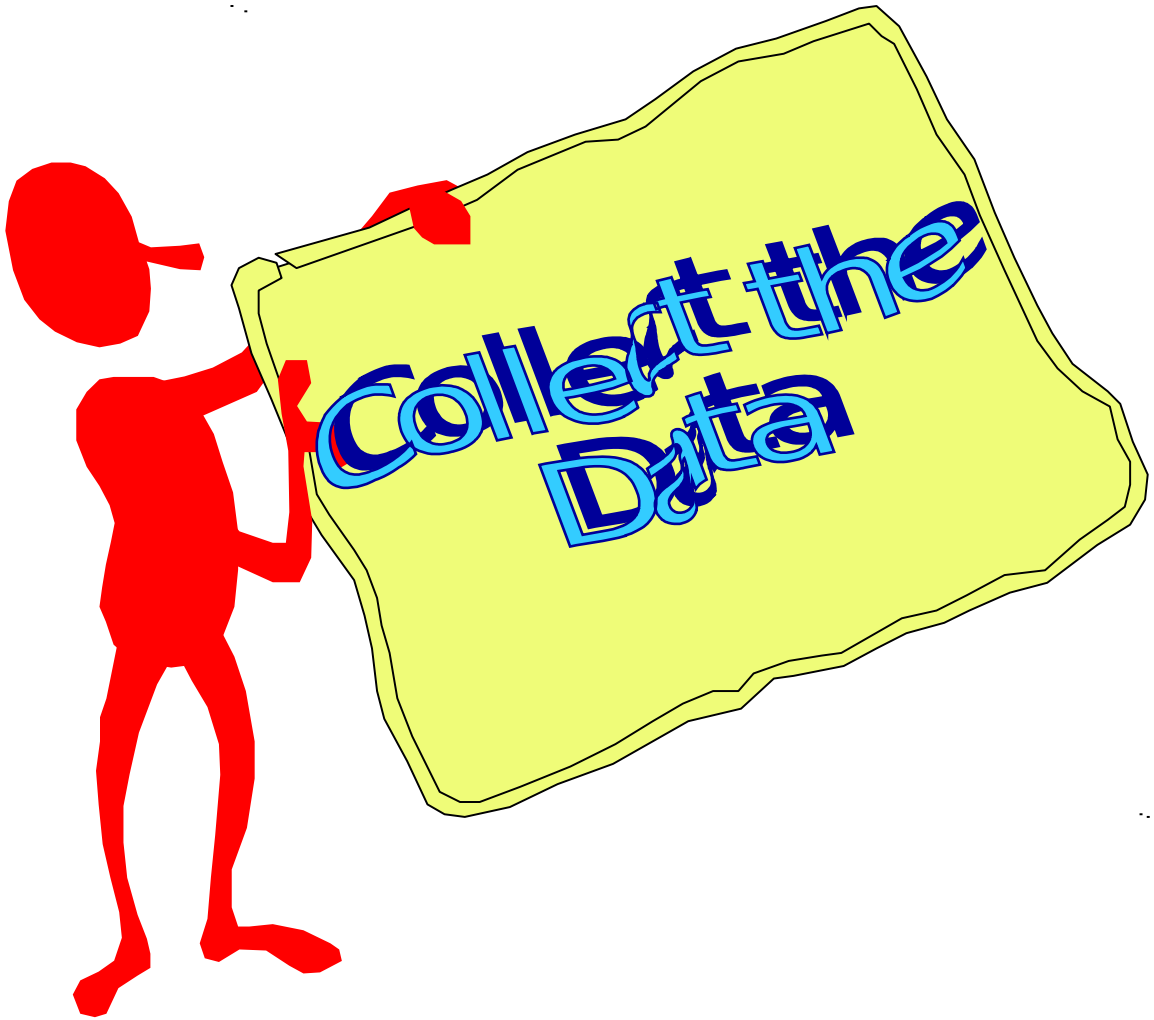
- Indicates "Change Control" using ICS (Performed by SCM; Released in IDE or Locked in Apex)

*: The Systems Requirements Model Developed in Rose is new for R5.

**: The SSC and SBE classes will continue to be maintained through R3. These Classes will be replaced with the Use Case class (UCS) for R5 and beyond

***: The BIS is placed in a CM control environment after CSCI Integration & Test for R3B3 only, thereafter BIS will be CM Controlled after the S/W Requirements Phase.

Figure 2
Baselines, Configuration Item Components, Change Authorities And Other Configuration Controlled Items Through PDRR


Collect the
Data

CM Audits

SCM Audit Report
AAL (R3 B3)

Date of Audit: 19 January 2001
SCM Auditor: Gaston A. Ray
CSCI Team Lead: John Bangs
Audit Attendees: Paul Prentiss
Christine Lewis

Audit Start Time: 10:15 Audit Stop Time: 10:25

This SCM Audit covers the following subsystems;

1. AALC: aal_ammunition_loading_coordinator.ss/
2. XLTR: aal_ammunition_translators.ss/
3. CANL: aal_cannon_loading_equipment.ss/
4. ARMC: aal_load_arm_controller.ss/
5. ARMD: aal_load_arm_drive.ss/

Platform (Name of the process(s) on which the software runs)	SunOS 5.6/LynxOS 3.01
Operating System (The operating system(s) and version(s):	RTCOE 2.95
Compiler (The language(s) in which the CSCI was written):	Ada 95, 3.1
Total SLOC Count:	5033

Questions:

1. What software tools were used during the development other than the Rational Toolset, IDE and RTM?

ANSWER: No other tools were used in this CSCI development.

2. Are the Apex Locations verified? See Actions taken by SCM.

Actions Taken by SCM:

1. RTM (Kim Gifford) contacted to apply CM lock to all ACL subsystems.

2. IDE. All items (requiring CM control) identified in the CMADS database have been placed under CM control:

   - RTM; Software Test Case and Software Test Results
   - IDE;

1. SRS (13012)
2. BRD (30007)
3. CSCI Build Plan (21675)
4. Unit Test Results GCSA 34965, all others 34966
5. Unit Test Plan GCSA 33931, all others 33930
6. CSCI Test Report 37547
7. SITP 33241
8. SITD 34714
9. BOM 37547
10. BIN Configuration 37547

- Apex; The following subsystems were located and verified in Layer 3;

1. aal_ammunition_loading_coordinator.ss/
   - CM Controlled: Yes
   - CSCI Integration BOM Verified: Yes
2. aal_ammunition_translators.ss/
   - CM Controlled: Yes
   - CSCI Integration BOM Verified: Yes
3. aal_cannon_loading_equipment.ss/
   - CM Controlled: Yes
   - CSCI Integration BOM Verified: Yes
4. aal_load_arm_controller.ss/
   - CM Controlled: Yes
   - CSCI Integration BOM Verified: Yes
5. aal_load_arm_drive.ss/
   - CM Controlled: Yes
   - CSCI Integration BOM Verified: Yes

NOTE: The following .ss are not part of R3B3 Activity:

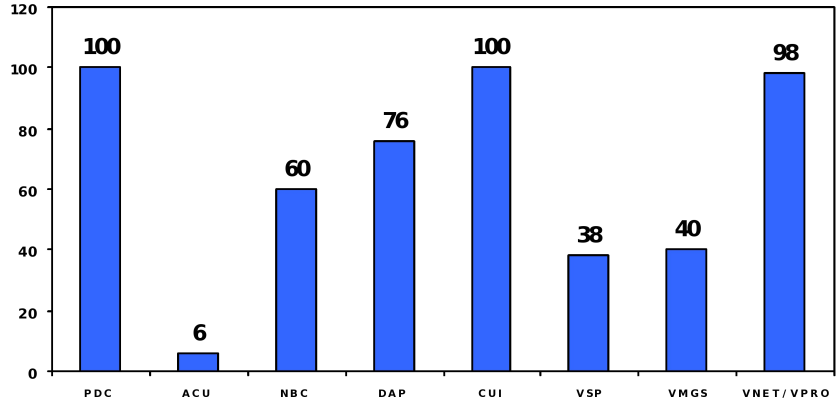
1. aal_bore_hazard_sensor.ss/,
2. aal_breech_drive.ss/,
3. aal_doors_cleaners_and_projectile_handling.ss/,
4. aal_fuze_setter.ss/, laser_window_washer.ss/

Findings/Action Items:

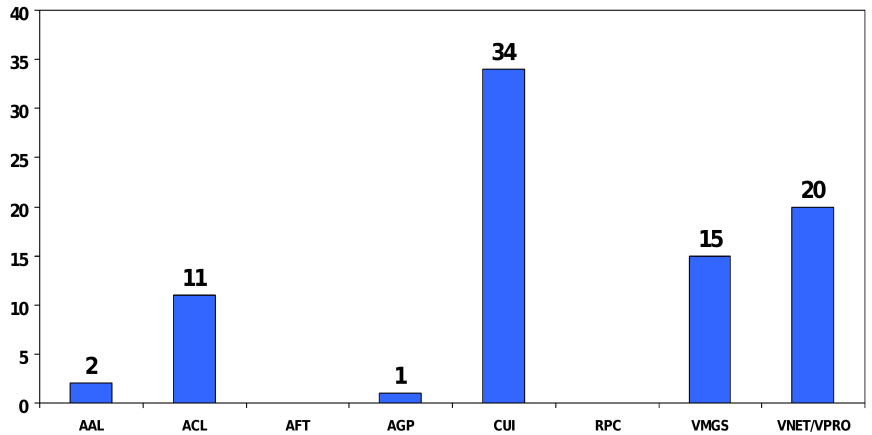
No Findings or Actions Items were noted.

"Without the Data….

You are just an Opinion"



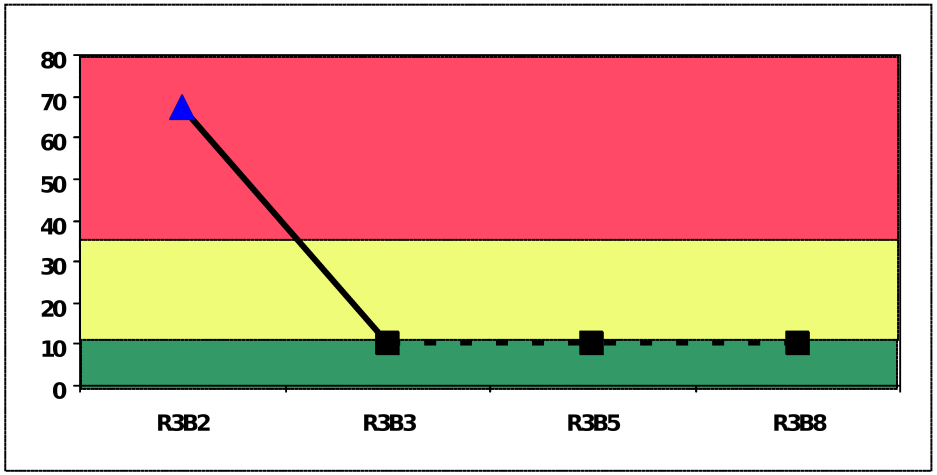
R3B2Mean 65 Workdays



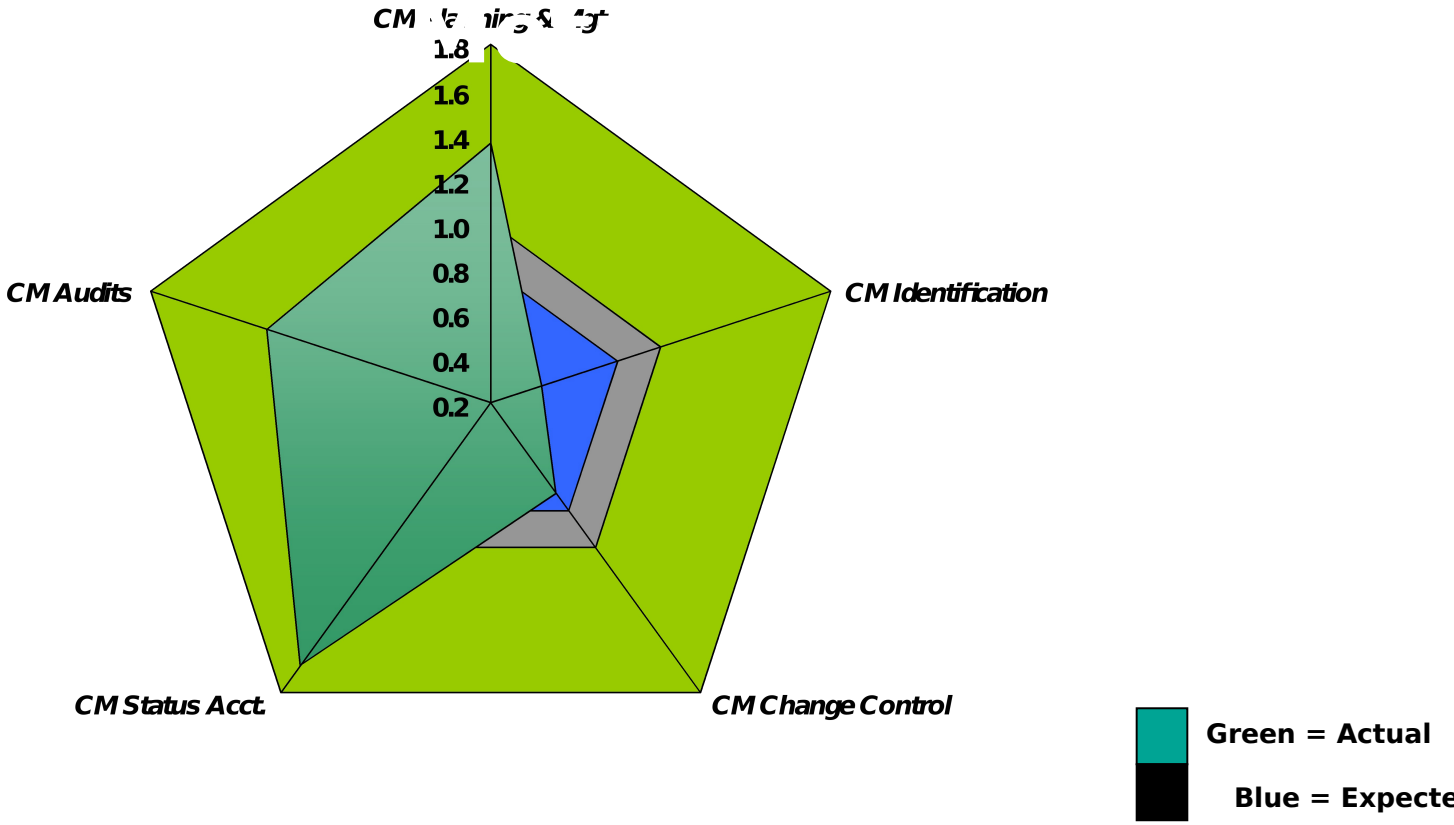
R3B3 Mean (as of 26 Feb 01) 14 Workday

Areas of Improvement

- SCM Procedures re-written to clarify process.
- SCM Process identified and defined.
- SCM Communications with Engineering Community Increased.



Red = Unacceptable
Yellow = Marginal
Green = Goal
▲ = Actual
■ = Estimate/Goal

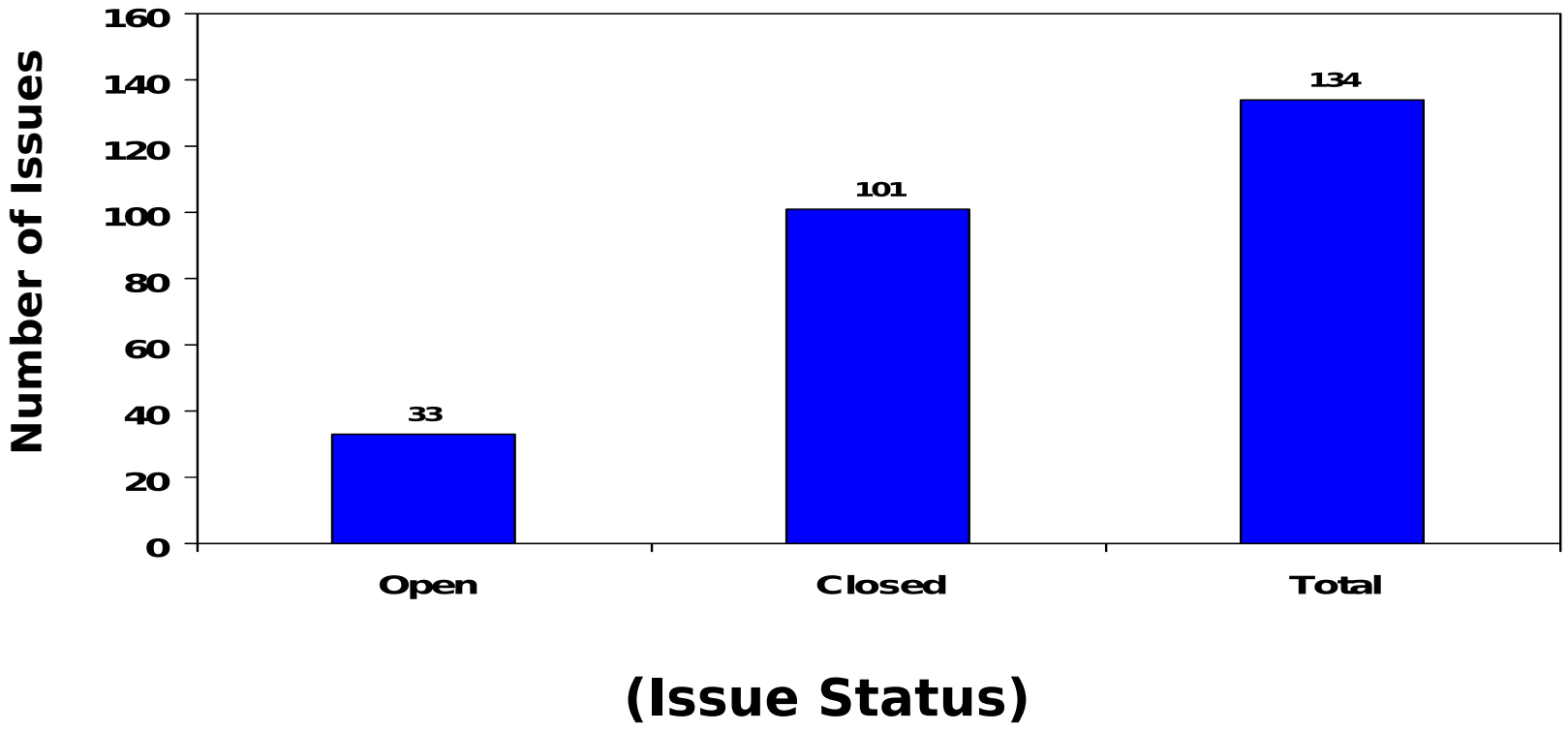


CM Performance Measurement Indicators		
Category	Jan 01	Feb 01
CM Planning & Mgt	1.34	1.36
CM Identification	.65	.44
CM Change Control	.95	.70
CM Status Acct.	1.99	1.65
CM Audits	3.32	1.25

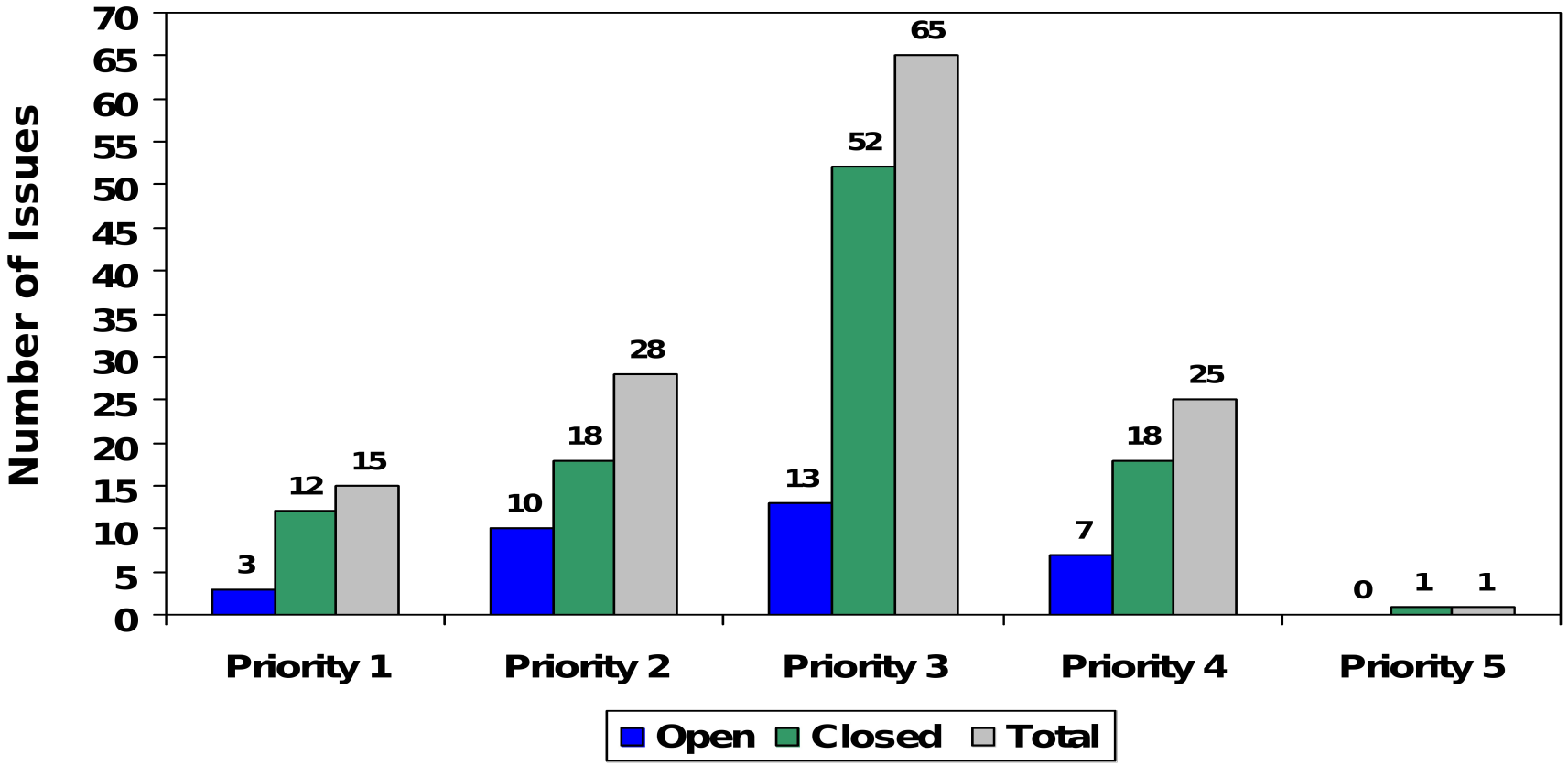
Analysis Rationale

1. CM Planning & Management: **In February a significant effort was spent creating and improving CM Process & Procedures (CRU-CM-008, CRU-CM-015, CRU-CM-022, CRU-CM-027, CRU-CM-032), creating the Registration & Briefings for the CSCI/CSC re-groupings, and creating the Crusader Configuration Items (CI) Tree.**
2. CM Status Accounting: **In February provided increased data capabilities in the CMADS and CARDS Database's, and produced & improved product structure for the Software Developmental Library (SDL).**
3. CM Audits: **In February conducted extensive Audits and Verification of CUI, AGP, and OSS data in CMADS.**

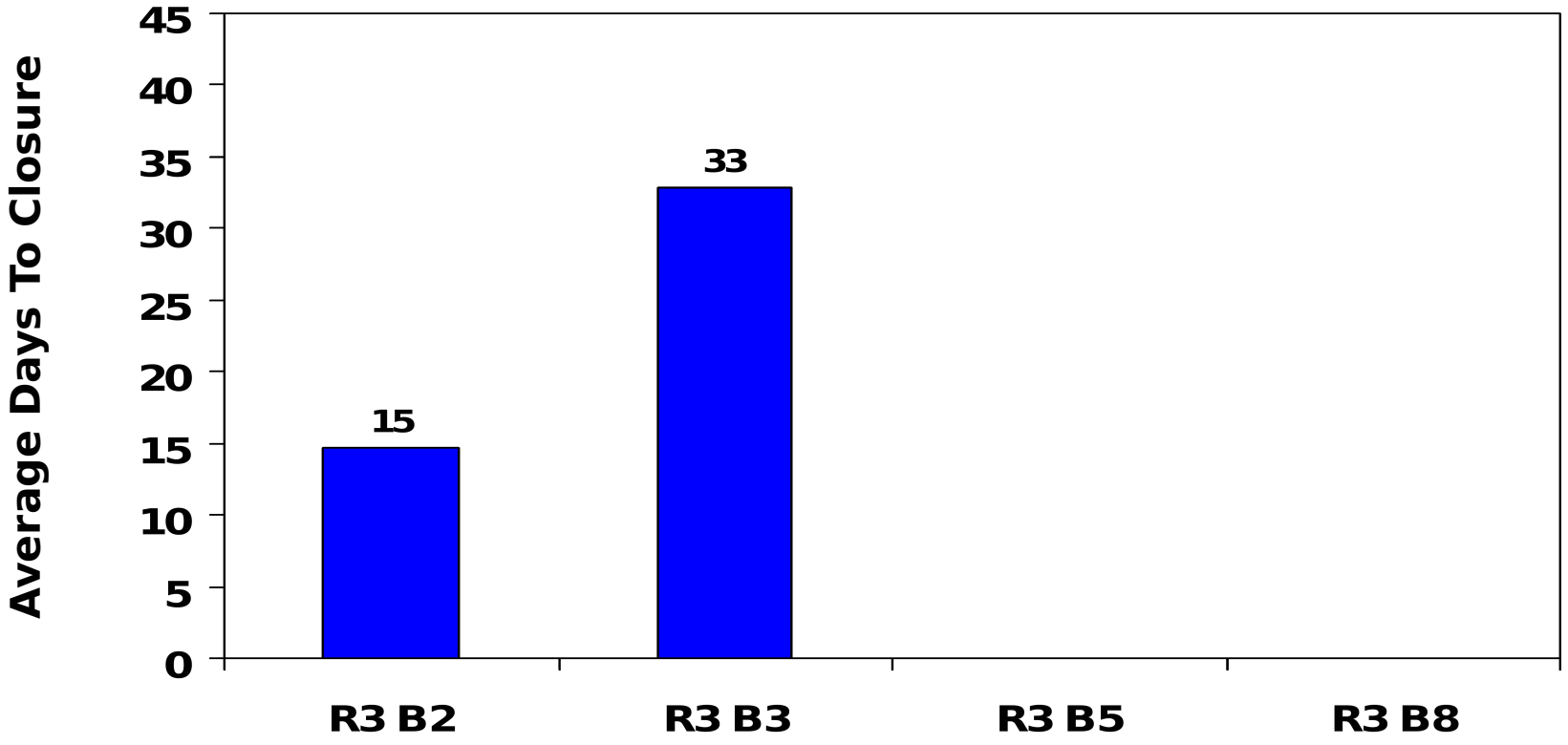
Release 3 Build 3
I&T SCCB



Release 3 Build 3
I&T SCCB

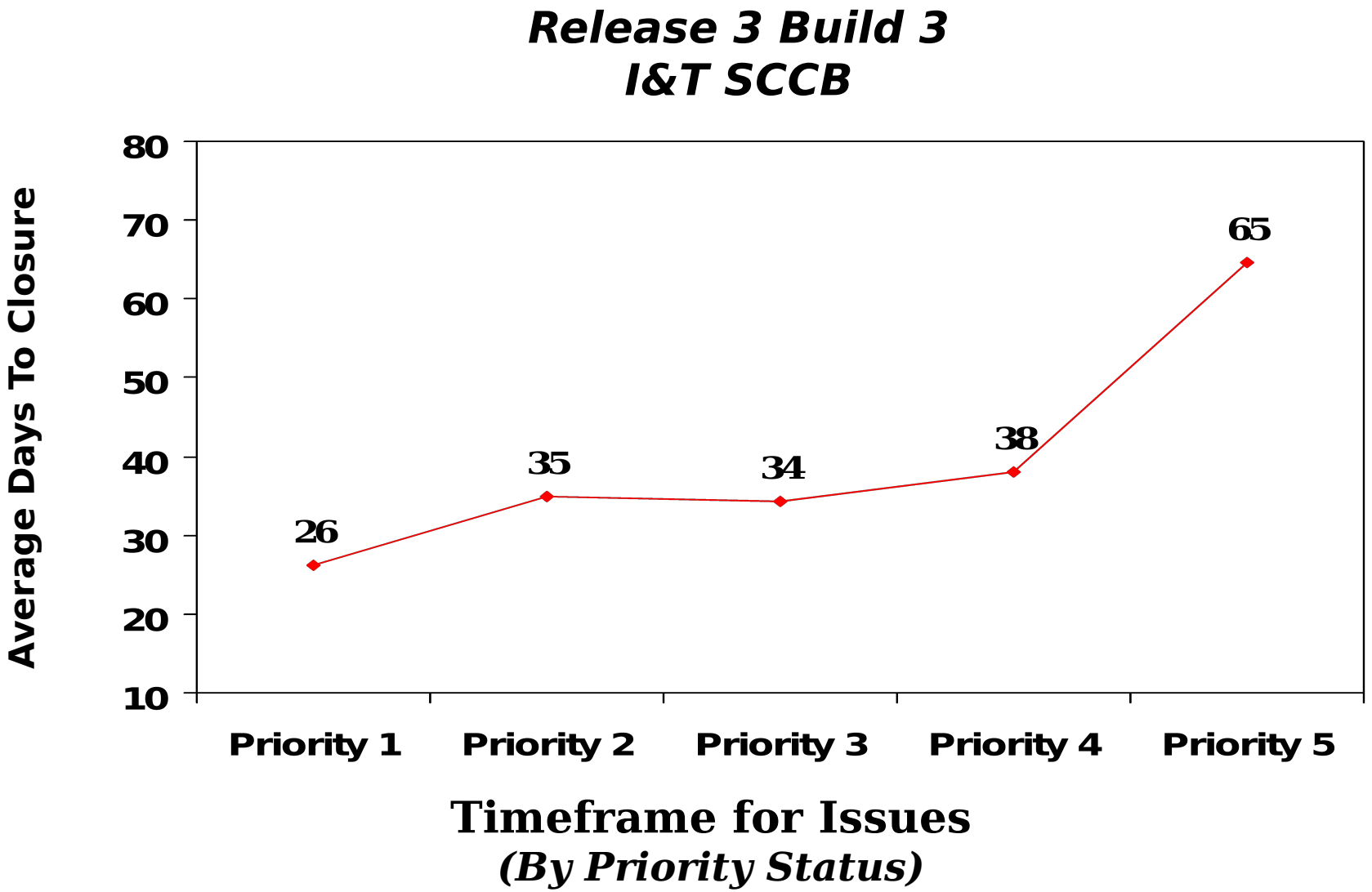


(Issue Status by Severity)



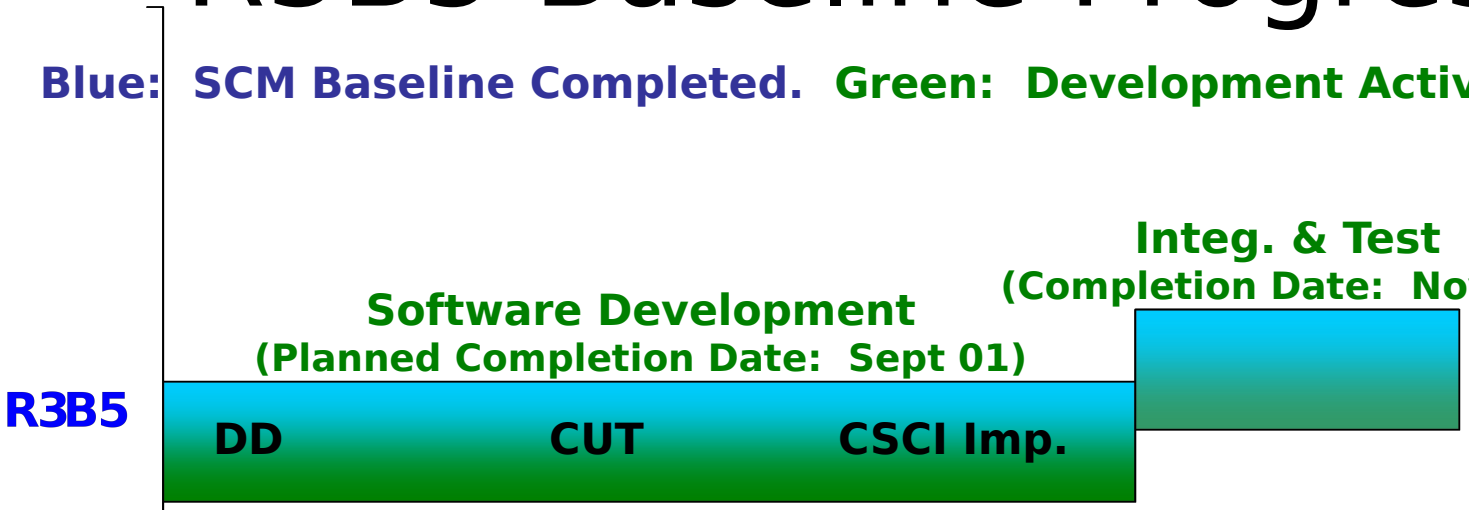
Overall Timeframe for Issues

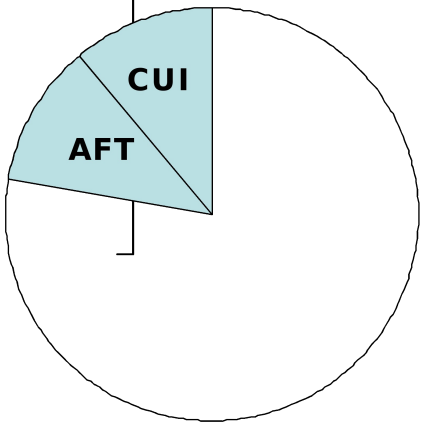
(Open to Closure Status – By Release & Build)


Release 3 Build 3
I&T SCCB
Average Days To Closure
80
70
60
50
40
30
20
10
26
35
34
38
65
Priority 1
Priority 2
Priority 3
Priority 4
Priority 5
Timeframe for Issues
(By Priority Status)

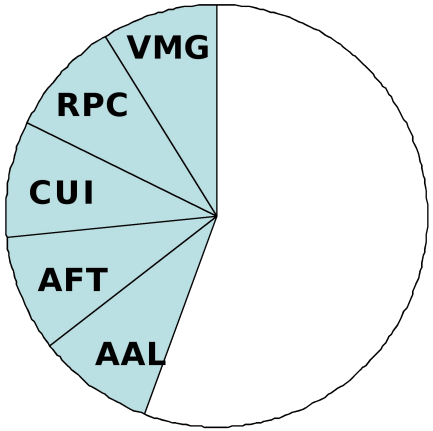
R3B5 Baseline Progress

Blue: SCM Baseline Completed. Green: Development Activities In-Progres

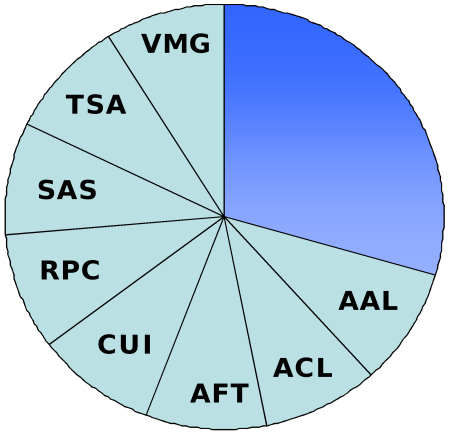




Detailed Design Walkthrough Activities 83% Complete

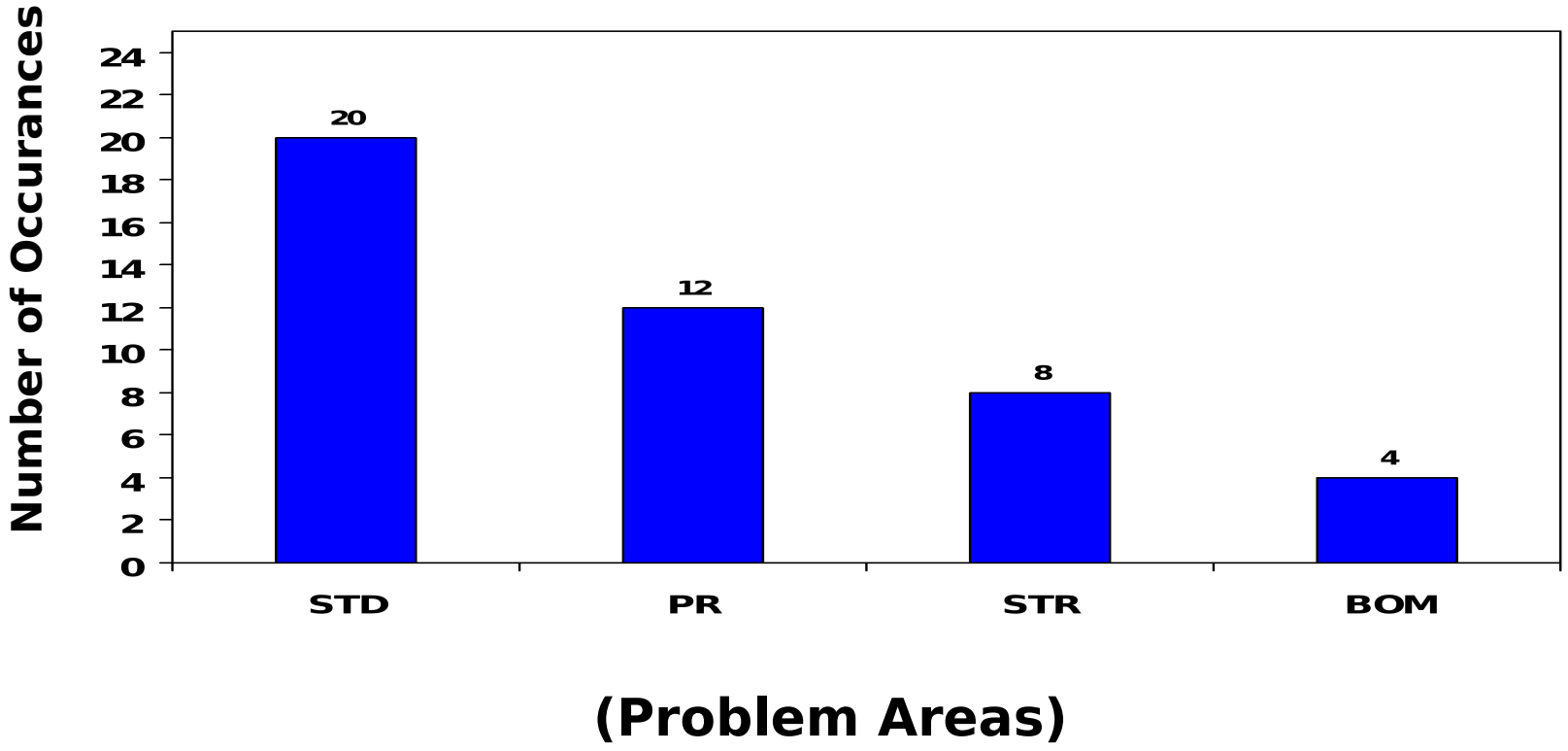


Code & Unit Test Walkthrough Activities 58% Complete



CSCI Implementation Walkthrough Activities 33%Complete

Audit Findings



CONCLUSION

- **Effective Configuration Management is critical to the success of the Program**.

  SCM is critical to:

  - Successful software development and the preservation of SW technical artifacts & baselines.

  - Achieving SEI-CMM L3 and beyond.